

WHAT IS CLAIMED IS:

1. An image conversion method in which image data represented by a required number of pixels is obtained from original image data represented by a predetermined number of pixels, comprising the steps of:

carrying out image conversion by obtaining, by interpolation calculation, image data represented by a number of pixels which is one-half of the predetermined number of pixels, from the original image data represented by the predetermined number of pixels;

preparing an intermediate image by repeatedly carrying out image conversion at a rate of one-half of the number of pixels, until a number of pixels close to the required number is reached; and

carrying out image conversion by obtaining, from the intermediate image, image data represented by the required number of pixels.

2. An image conversion method according to claim 1, wherein interpolation calculation, which is carried out when the image conversion for preparing the intermediate image is effected, is different from interpolation calculation, which is carried out when the image conversion for obtaining the image data represented by the required number of pixels from the

intermediate image is effected.

3. An image conversion method according to claim 1, wherein the intermediate image has a number of pixels which is greater than and closest to the required number of pixels.

4. An image conversion method according to claim 1, wherein the intermediate image is prepared by dividing the original image data into partial images and repeatedly carrying out the image conversion to one-half of the number of pixels for each of the partial images.

5. An image conversion method according to claim 1, wherein the interpolation calculation is carried out by using at least two types of interpolation calculation methods.

6. An image conversion method in which image data represented by a required number of pixels is obtained from original image data represented by a predetermined number of pixels by repeatedly carrying out interpolation calculation at a rate of one-half of the number of pixels, wherein image data represented by the required number of pixels is obtained by carrying out

interpolation calculation at a rate of x (wherein $1 > x > 1/2$) of a number of pixels at one of a beginning step, an intermediate step, and a final step of image conversion.

7. An image conversion method in which image data represented by a required number of pixels is obtained from original image data represented by a predetermined number of pixels, comprising the steps of:

obtaining by interpolation calculation, from the original image data represented by the predetermined number of pixels, image data represented by a number of pixels of $1/N$ (wherein N is an integer of 2 or more) or greater, by using an N -size filter used to obtain an interpolated point from N pixels, thereby allowing image conversion; and

obtaining image data represented by the required number of pixels by carrying out the interpolation calculation plural times.

8. An image conversion method according to claim 7, wherein the required number of pixels is $1/N$ (wherein N is an integer of 2 or more) or less.

9. An image conversion method according to claim 7, wherein the interpolation calculations carried out plural

times are effected in order from that of the lowest conversion rate.

10. An image conversion method according to claim 7, wherein the interpolation calculation is carried out by using at least two types of interpolation calculation methods.

11. An image conversion apparatus comprising:
setting means for setting a number of pixels after image conversion of original image data represented by a predetermined number of pixels;

interpolation calculation means which effects image conversion by obtaining, by interpolation calculation, image data represented by pixels of the number set by said setting means; and

control means which controls said interpolation calculation means such that said interpolation calculation means converts the original image data into an intermediate image having a number of pixels close to the number of pixels set by said setting means by repeatedly effecting the image conversion to one-half and such that said interpolation calculation means carries out image conversion to further make the intermediate image into the set number of pixels.

12. An image conversion apparatus comprising:

setting means for setting a number of pixels after image conversion of original image data represented by a predetermined number of pixels;

first interpolation calculation means which effects image conversion by obtaining, by interpolation calculation and from the original image data represented by the predetermined number of pixels, image data represented by pixels of a number which is one-half of the predetermined number of pixels, and prepares an intermediate image by repeatedly effecting the image conversion at a rate of one-half until a number of pixels close to the required number of pixels is reached; and

second interpolation calculation means which effects interpolation calculation such that the intermediate image is further made into image data represented by pixels of the number set by said setting means.

13. An image conversion apparatus comprising:

setting means for setting a number of pixels after image conversion of original image data represented by a predetermined number of pixels;

interpolation calculation means which effects

interpolation calculation at a rate of $1/N$ (wherein N is an integer of 2 or more) or greater by using an N -size filter used for obtaining an interpolated point from N pixels; and

control means which controls said interpolation calculation means so that image data represented by pixels of the number set by said setting means is obtained by effecting the interpolation calculation plural times.

14. An image conversion processing program which allows image conversion processing, for converting original image data represented by a predetermined number of pixels to image data representing an image by a set number of pixels, to be executed by a computer, comprising:

a first step in which image conversion is effected by obtaining, by interpolation calculation, image data represented by pixels of a number which is one-half of the predetermined number of pixels from the original image data represented by the predetermined number of pixels, and an intermediate image is prepared by repeatedly effecting the image conversion to one-half until a number of pixels close to a required number of pixels is reached; and

a second step in which image conversion is effected by obtaining image data represented by a required number of pixels from the intermediate image prepared in said first step.

15. An image conversion processing program which allows image conversion processing, for converting original image data represented by a predetermined number of pixels to image data representing an image by a set number of pixels, to be executed by a computer, comprising:

a first step in which image data, which is represented by a number of pixels which is reduced to $1/N$ (wherein N is an integer of 2 or more) of the predetermined number of pixels, is obtained by interpolation calculation from original image data represented by the predetermined number of pixels, by using an N -size filter used for obtaining an interpolated point from N pixels; and

a second step in which image data represented by a required number of pixels is obtained by carrying out said first step plural times.

16. A recording medium on which the image conversion processing program according to claim 14 is

recorded.

17. A recording medium on which the image conversion processing program according to claim 15 is recorded.

18. An image conversion method in which image data represented by a required number of pixels is obtained from original image data represented by a predetermined number of pixels, comprising the steps of:

repeatedly carrying out image conversion which obtains, by interpolation calculation and from initial image data, subsequent image data represented by a number of pixels which is one-half of the number of pixels of the initial image data, said image conversion being repeatedly carried out from the original image data until the number of pixels of image data obtained by the image conversion is near the required number of pixels; and

obtaining, from image data of the number of pixels near the required number of pixels, image data represented by the required number of pixels.